WEATHERING THE STORM

POSTER SHOWCASE #IAEM24

AMANDA MCHALE, DRPH, MPH
MCKENSIE SCOTT, MPH, SMALL FAMILY FARMER
JENNIFER RUSSOMANNO DRPH, MPH, CHES, SMALL FAMILY FARMER
JENNIFER BURNETTE, MPH
NON-COMPETITIVE DIVISION

HOW EXTREME WEATHER AFFECTS SMALL FAMILY FARMS IN TENNESSEE

INTRODUCTION

The rise in extreme weather events presents significant challenges for farming, an industry that largely defines TN's landscape. Small family farms, defined as those with a gross cash farm income of less than $350,000 annually,[1] make up more than 93% of farms in TN and play a vital role in supporting local economies and ensuring food security.[2] Yet, they often lack adequate resources to cope with and recover from extreme weather. This can lead to challenges for farmers and emergency managers alike, such as remediating environmental hazards or managing shelter for livestock. Understanding these challenges can help emergency managers better plan for and respond to farmers' needs.

RESEARCH QUESTIONS

- How do small family farmers in East TN prepare for and respond to extreme weather events?
- What are the impacts of managing extreme weather events on the physical, mental, and financial health of small family farmers?

OBJECTIVE

To understand the challenges that small family farmers face when managing extreme weather.

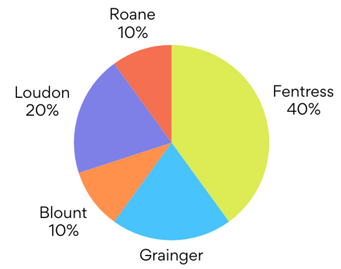
METHODOLOGY

Researchers from Oak Ridge Associated Universities and the University of Tennessee conducted in-depth interviews with small family farmers residing in five rural East Tennessee counties: Blount, Fentress, Grainger, Loudon, and Roane. These counties were selected because of their large number of small family farms and rising rates of extreme weather. Interviews were transcribed and analyzed using direct content analysis guided by the CDC's One Health approach.

KEY FINDINGS

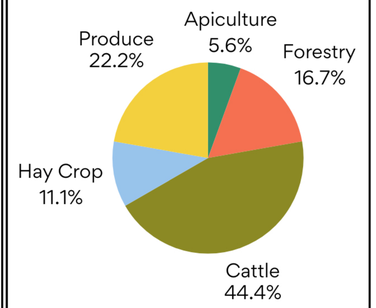
A total of 20 farmers representing 18 farms participated in interviews (two interviews had two participants). Figure 1 includes a breakdown of the number of participants per county. There were fourteen male participants and six female participants, and farming experience ranged from two to over fifty years. The primary farm productions included cattle, produce, hay crop, apiculture, and forestry (see Figure 2). The most frequently reported extreme weather occurrences included droughts, high winds, floods, freezes, and tornadoes. Aligned with the CDC's One Health approach, three overarching themes were identified: 1) human health, 2) environmental health, and 3) animal health.

FIGURE 1



Distribution of Study Participants by County

FIGURE 2



Primary Farm Production

SIGNIFICANCE

Small family farms make up nearly 90% of the farms in the U.S.[3] Despite their prevalence, limited research exists on the impact of extreme weather events, with most studies focusing on large farms that produce more commodities. These studies may overlook the unique challenges small family farmers face and can lead to ineffective and insufficient solutions. This pilot study represents a first step in understanding the specific challenges small family farms encounter during extreme weather.

THEMES

THEME 1: HUMAN HEALTH

Preparing for and responding to extreme weather led to:

- physical health impacts
- mental health challenges
- financial strain

Farmers possessed resiliency, received support from their community & had a second source of income.

*"...we manage the stress because of the **love** for what we're doing."*

"Anytime that you lose a crop that you're depending on for income is very stressful."

"Well, the fatigue starts in June, doesn't let up until probably October. I tell myself I'll sleep more. Some year I will."

THEME 2: ENVIRONMENTAL HEALTH

Extreme weather events had direct environmental impacts including:

- crop loss
- soil erosion
- water scarcity
- increased pests
- loss of trees and vegetation

Farmers monitored weather to prepare and responded by adopting long-term strategies, such as improving soil health and selecting resilient crops.

*"...we've learned to be more **selective** about the plants that we do plant."*

"Because the ground is not freezing as much as it used to, we've had to make certain decisions and steps to try to control that erosion."

"I'll usually look at two different weather apps to try to figure out what's more likely going to do."

THEME 3: ANIMAL HEALTH

Extreme weather had direct impacts on farm animals including:

- death
- injury
- feed and water scarcity

Farmers prepared in various ways such as stockpiling feed and providing shelter.

"We usually keep hay out because that's how cows stay warm, is by eating."

*"I think it **killed** six or eight. Eight, I think, cows. Lightning is pretty bad down [in] their section."*

"A lot of times I'll just load them up and try to take them to the vet."

CONCLUSION

Findings provide insight into how small family farmers in rural East Tennessee manage extreme weather and its impact on human, environmental, and animal health. Considering that different regions experience different weather patterns, additional research is needed to gain a more comprehensive understanding of how small family farmers across the U.S. are impacted by extreme weather. This broader understanding can inform policy, strategies, and practices tailored to the unique needs of small family farms and help mitigate broader impacts on their communities.

Emergency Resource Guide

References

RESEARCH SPONSORED BY FUNDS PROVIDED BY THE OAK RIDGE ASSOCIATED UNIVERSITIES FOUNDATION, ORAU-DIRECTED RESEARCH AND DEVELOPMENT PROGRAM